

Insect Conservation in Mixed Woodland and Ancient Parkland¹

J. M. CHALMERS-HUNT, F.R.E.S.

Insect conservation in our native woodlands and the management of woodland reserves from an entomological standpoint is of increasing urgency nowadays, yet still there appears to be little available literature in this field. The purpose of this paper is to outline some of the main features of the subject, with a view to showing what ought to be done to try to safeguard these areas and the many rare and interesting insects they contain before it is too late.

WOODLAND BIOTOPES

It is important that samples of all types of woodland in every stage of development and on all geological formations should be preserved in the interests of insect conservation, and for these to contain as great a variety of suitable habitat as possible. The differences in the nature of woodland biotopes are of vital significance because each biotope supports characteristically distinct insect communities, and if a particular biotope no longer exists, certain species may be lost. There are a good many kinds of woodland biotope, so that for the sake of conciseness, they are listed as follows:—

(i) Glades, rides, heathy patches, woodland paths, edges of woods particularly those facing south, wooded downland and railway cuttings in woods, grassy and flowery verges and clearings containing the following associated woodland ground flora, e.g. Golden-rod (*Solidago virgaurea*), Devil's-bit Scabious (*Scabiosa succisa*), Cow-wheat (*Melampyrum pratense*), *Viola* spp., St. John's Wort (*Hypericum*), Wood Spurge (*Euphorbia amygdaloides*), *Potentilla erecta*, Vetches (*Vicia* spp.), Bilberry (*Vaccinium*), Honeysuckle (*Lonicera*), *Brachypodium*, *Dactylis*, *Luzula*, etc.

(ii) Bogs, ponds and their surrounds, ditches, wet mossy places.

(iii) Damp gullies, ravines.

(iv) Coppice, including oak, aspen, birch, hazel, sweet chestnut; Seedling aspen, stool oak; Sallow, aspen, elm and dogwood stands; Blackthorn and hawthorn thickets.

(v) Plant debris and litter, birds' nests, chestnut stump clippings, bundles of faggots, piles of brushwood and similar timber; fallen leaves, fruits and catkins; burnt areas.

(vi) Standing dead trees and lying dead trees (Note: these appear to constitute two distinct biotopes, as faunas of standing and lying dead wood seem to be different); Rotting stumps, decaying logs, dead or dying spruce and related conifers; Fungi on decayed wood, on trunks, rotten or old boughs, or in damp conditions generally; Wood mould and red rot of various trees; Ivy covered trees and walls; Old lichen covered trees and fences.

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(vii) Ancient beeches, oaks and elms in parkland; Old beech woodland. Birch trees of great age; High canopy.

(viii) Sallow and alder carr.; Osier beds; Marshy woodland containing Valerian (*Valeriana* spp.), *Angelica*, *Cardamine pratensis*, Yellow Loosestrife (*Lysimachia*), *Symphytum*, *Spiraea*, *Myrica*, and other associated wet woodland plants.

(ix) Deer dung, putrifying remains, excrement, dead animals.

(x) Ants' nests, especially those of the Wood Ant (*Formica rufa*).

SOME ASPECTS OF MANAGEMENT

1. *The Preservation of Woodland in which the Environment has not Appreciably Deteriorated*

It seems desirable to maintain so far as possible good areas of more open woodland with a plentiful growth of young oak, birch, sallow, aspen, etc., among the larger trees, and where the wood becomes very thick and straggly with little room for shrubs and too dark and dense for ground flora to flourish, to make clearings here and there to let in sunshine and allow flowers and herbs to spring up. Moderate sized clearings (especially if surrounded on all sides by mature woodland) soon develop a rich insect fauna which tends to remain until densely wooded conditions begin to be restored. Grass under the trees and in the clearings is on the whole favourable, and Golden-rod which favours such places should be encouraged as it supports a number of local species.

On the other hand, we consider the judicious removal of some rhododendron should be undertaken if creating too much shade, and in a reserve, virtually all dense conifers. Where bramble and bracken become dominant and all-pervading it is a good plan to get rid of most of these from time to time, except where the brambles flower very freely, since the flowers are attractive to insects. To encourage the many wood-feeding species and the associated fauna, fallen timber, stumps, etc., should be left to decay naturally, and standing dead wood should be left, rather than felled.

Although many insects feed on a particular tree at any stage of its growth, there are others which are associated only with young, mature or old trees. It is therefore necessary that a reasonable acreage of coppice should be cut down each year, thus ensuring that trees of all ages from one to twelve years will always be available to provide the needs of a wide range of insects associated with this kind of habitat. In addition, a small acreage of trees should be left to mature without cutting, to provide for those species associated with the older trees.

If it is considered necessary to control vegetation by the use of herbicides, these should only be painted on and *never sprayed*, for the consequence of such action could be incalculable.

Broadly speaking then, the ideal wood, from an entomologist's point of view, would be managed as follows:—

- (a) There would be the maximum viable number of species of tree.
- (b) There would be enough of each species of tree to ensure that at any time there were young, mature and old specimens.
- (c) The wood would not be meticulously tidy; for example:—Bonfire areas would be left undisturbed to mature and there would therefore be several such areas to be used in three to five year rotation. Fallen and decayed stumps would not all be removed

—there would always be a few mature 'derelict' areas. Epiphytes, such as ivy and fungi, would be allowed to survive and indeed thrive in selected 'marginal' areas. Finally, drainage should not be exemplary; a relatively water logged area should not be eliminated.

2. *Restoration so far as Possible and when Expedient of the Status Ante of Woodland*

In the case of woodland that has become derelict, but which was formerly suitable as an entomological environment, it may be desirable to restore it in some degree to its former state. This is sometimes possible with careful planning, and the creation of suitable habitats. It is important, however, that such habitats be of viable size, that they should not fragment existing ones, and furthermore, that they should be relevant to any that may be already in existence on a reserve. It is not proposed here to enter into detail but the undermentioned general prescriptions are noteworthy.

- (i) The creation of ponds by damming small valleys.
- (ii) Reduction of coppice stems by singling of e.g., hornbeam, ash and sweet chestnut.
- (iii) The formation of glades.
- (iv) Introduction of normal coppicing of e.g., hazel, birch, aspen and sweet chestnut.
- (v) The opening up of rides with stepped margins, to form a central grassy area flanked by shrubs which gradually merge into the woodland beyond. This system produces highly favourable conditions for many insects, especially if due consideration be given to sunny aspect.

SOME SUGGESTIONS CONCERNING CONSERVATION OF ANCIENT PARKLAND AND RELICT FORESTLAND

Knole Park. The conservation of relict forestland and of old trees of parkland is very urgent, since too many of these places show little or no sign of regeneration. Knole Park, for instance, is an extremely important locality with many old beech trees in various stages of decay, and associated fungi. Largely owing to the excessive numbers of deer, however, there are very few areas in the park where any regeneration is possible, and attempts at planting young trees have been half hearted, with only a few planted here and there in the clearings.

The danger, therefore, that continuity in these woodlands will be seriously affected in the near future is obvious; Knole may be good for another century but its existing timber will at some time run out if nothing is done very soon. Clearly then, all existing decaying trees in old woodlands should be protected, natural regeneration should be allowed to occur by limiting grazing and the trampling of seedlings, and artificial planting of trees in these localities should also be carried out. Thus a considerable effort is required if an adequate supply of development media for the invertebrates dependent on rotten wood and lignicolous fungi is to be constantly maintained.

Windsor Great Park and Forest. One of the finest localities in the whole country for species associated with wood, is Windsor Forest (in the broad sense as including the Park), and it is regrettable that

destruction of so many fine old trees seems to have been proceeding in the Forest to make room for conifer planting, for it is these old trees (oak and birch) that harbour the great rarities, the 'primary forest relicts'.

It may, perhaps, be assumed that conditions in the Great Park (as opposed to those in the Forest) will remain more favourable, but two points should be noted. (1) There has been a tendency of late years, when trees fall or are felled, to bulldoze the stumps out of the ground or burn them. This surely serves no sufficient purpose and should be forbidden—as also should the removal of fallen or felled trunks, etc. not suitable for timber because too decayed (the top parts of the tree, in such cases, may always be removed without adverse effect on the fauna). Before the 1940's there was always plenty of old timber left lying about, and the fauna was correspondingly richer. (2) During the same period, considerable areas in the Park have been enclosed and converted to arable land. In general this may have done little harm so far, but there seems a danger that the practice may be extended. For instance, it has been noticed that of late years still more and larger areas have been enclosed—for what purpose is not at present clear.

In view of its unique entomological interest, we regard it as urgent that as much as possible of Windsor Great Park (if not also the remaining fragments of forest proper) be protected against any further inroads. This, incidentally, applies equally to Sherwood Forest and to Moccas Park, Hereford, if not already secured.

RESERVE DISCIPLINES—SOME RECOMMENDATIONS¹

1. *Wardening. The Collecting of Insects. Introductions*

We should like to stress that entry to reserves be strictly controlled, but that within their confines, judicious collecting and release for population studies, as well as collecting for the purpose of case histories and the preparation of surveys, be encouraged. On the other hand, we wish to emphasise the necessity for preventing collecting from being carried out for commercial purposes, a practice that may now be on the increase, particularly since the attempted conditioning of the public by a well-known author, broadcaster and dealer into believing that indiscriminate rearing of butterflies—irrespective of their origin—and release of the progeny, assists conservation.

The subject of introductions in its various aspects is ably treated by Perring and Streeter (1968). Broadly speaking, to release insect populations away from the place of origin is considered harmful, and only in exceptional circumstances and under strictly controlled conditions is it sometimes beneficial to do so. It is essential furthermore—and we cannot too strongly emphasise the importance of this—that no attempt at introduction should be made without prior notification to the Biological Records centre².

2. *The Keeping of Records*

Accurate lists with data of as many invertebrate Orders as possible should be prepared for each reserve. It is important that adequate records be kept of existing conditions obtaining prior to management, and of all

¹The policies outlined under this head apply to all forms of reserve, woodland or otherwise.

²Biological Records Centre, Monks Wood Experimental Station, The Nature Conservancy, Abbots Ripton, Huntingdon.

changes that take place subsequently in the course of management, particularly in regard to biotopes and the status of the fauna. It would be a good plan too, to publish the effects of such management operations, preferably in a periodical devoted to conservation¹.

SOME WOODLAND AND OLD PARKLAND LOCALITIES OF ENTOMOLOGICAL INTEREST IN S.E. ENGLAND, WITH BRIEF NOTES ON CERTAIN LOCAL OR RARE INSECTS FOUND THERE

Though there are many insect species in this region in urgent need of conservation, it must be understood that owing to limited space, we can only cite a few of them here; and for the same reason, the number of interesting localities given could have been considerably increased, and the notes much extended.

Several localities referred to hereunder are situated not far from the metropolis. We would like to state that these ought not to be neglected by conservationists simply because they are submerged in the outer suburbs; their importance is increased because they have acted as refuges for insects from surrounding areas, and it is probably true to say that the same applies to other suburban woods.

Blean Woods (part National Nature Reserve). Mixed woodland, stool oak, sweet chestnut, beech and hornbeam coppice, with oak standards on gravels over London clay. Lepidoptera: Blean is famous as a locality for the Heath Fritillary (*Melitaea athalia*), which depends for survival upon the growth of Cow-wheat (*Melampyrum pratense*) in woodland clearings, and the butterfly would undoubtedly become extinct (as has been the case at Chattenden and elsewhere) were it not for periodic coppicing. Coleoptera: *Borboropora kraatzi*, an extremely rare rove beetle associated with the Wood Ant; *Platyrhinus resinosus*, a weevil breeding in the black fungus *Daldinia concentrica*, growing on old ash, beech, etc.; *Tropideres sepicola*, associated with faggots and old gnarled boughs, etc. Hemiptera-Heteroptera: *Sehirus biguttatus*, a rare shield-bug associated with Cow-wheat; *Aradus aterrimus*, amongst chippings of chestnut stumps. Diptera: *Phaonia apicalis*, taken by L. Parmenter, in 1964, the only British record.

Darenth Wood (S.S.S.I.). Mixed woodland including old stool oak on Blackheath pebble beds, Woolwich bed loams and Thanet sand and chalk. One of the classic hunting-grounds of London collectors of the last century. The number of rare species, especially of Lepidoptera, Coleoptera and Hemiptera-Heteroptera is very considerable.

Epping Forest (Corporation of City of London P.O.S.; S.S.S.I.). Old high forest; hornbeam, beech and oak. Another classic hunting-ground of the 19th century. Coleoptera: *Graphoderus cinereus* and *Ilybius subaeneus*, rare water beetles, in a pond at High Beech; *Enicmus rugosus*, in powdery fungi on old logs; *Lathidius norvegicus*, only known on a single specimen from Oslo, until discovered on a beech that had been burnt in Monk Wood; *Hippodamia 13-punctata*, a very rare ladybird; *Soaptia testacea*, on trees in which there is red rot; *Aphodius conspurcatus*, in horse or cow dung; and *Malthodes crassicornis*, a great rarity. Hemiptera-Heteroptera:

¹As yet there exists no such periodical in this country; however, one hopes that it may not be so long now before the need for one is fully realised, and a national magazine for the conservation of nature in Britain as a whole becomes available.

Spathocera dahlmanni, associated with Sheep's Sorrel (*Rumex acetosella*), especially on ground recently burnt; *Eupicoris baerenspringi* an even rarer species of gnat bug, taken on beech trunks. Diptera: *Ferdinandia ruficornis*, a very rare hover fly which develops in the sap of wounded trees.

Ham Fen (S.S.S.I.; K.T.N.C. Reserve). Valley fen on chalk, with willow carr and many rare plants; primeval in character. Lepidoptera: Scarlet Tiger (*Panaxia dominula*), perhaps its last Kent station, since its recent extermination at Kingsdown by a dealer. Noted also for many other local species.

Ham Street Woods (National Nature Reserve). Mainly oak standards, with hornbeam, some ash and hazel coppice. Not to be confused with Orlestone Forest (see below). Comparatively little entomologising has been done here as yet, but owing to good management, the locality is certainly deserving of more attention than heretofore. Lepidoptera: *Agrotera nemoralis*, a rare and beautiful Pyralid on hornbeam.

Knole Park (S.S.S.I.; part National Trust). Beech-oak parkland and open woodland, with many ancient trees. Particularly good for Coleoptera, e.g. *Phyllodrepa puberula*, a very rare rove beetle found under bark, true habitat unknown perhaps associated with birds' nests; *Synchita separanda* on beech bark; *Geotrupes vernalis*, taken under deer dung by Dr. Massee. Diptera: *Parachesia tigrina*, extremely rare, associated with fungi and rotten wood, taken by A. A. Allen; *Spania nigra*, also very rare, taken by P. J. Chandler.

Orlestone Forest, commonly known as "Ham Street" (Forestry Commission; part K.T.N.C. Reserve). Damp mixed woodland on Weald clay plateau with oak standards, coppiced aspen, birch, willow, etc., interspersed with heathy patches, grassy flower rides. These conditions were much more prevalent a decade or so ago, since when owing to the effect of poison sprays and extensive conifer planting, much of the character of the wood has changed. It must be said though, that owing to co-operation from the Forestry Commission, a small but unspoiled and highly suitable area in Long Rope and Faggs has lately been established as a Trust Reserve.

Orlestone Forest constitutes what is generally regarded as the finest locality for woodland Lepidoptera in the whole of the British Isles. It is of outstanding importance for a number of reasons. For example: the exceptional fact that it is the home of several species now known from nowhere else in Britain, and its great interest for the number of comparatively rare species that occur there in relative plenty. Two of particular interest are the magnificent Clifden Nonpareil (*Catocala fraxini*), and the extremely local Lesser Belle (*Colobochyla salicalis*). Both despite their names feed on Aspen—*fraxini* on the larger tree foliage; *salicalis* on the young growth, especially the tender hairy leaves of seedlings. Other Orlestone specialities, whose larvae feed on the leaves of a variety of deciduous trees and associated ground flora, are The Purple Emperor (*Apatura iris*); Lunar Double-stripe (*Minucia lunaris*), on stool oak foliage; Sub-angled Wave (*Scopula nigropunctata*); Pretty Marbled (*Jaspidia deceptoria*); Scarce Merveille du Jour (*Moma alpium*), and a great many more. Orlestone is also an exceptionally good locality for many rare Coleoptera, Hemiptera-Heteroptera, and Diptera.

Windsor Great Park and Forest (Crown Land; S.S.S.I.). For Coleoptera associated with wood, this is apparently the finest locality in the whole country, not even excepting the New Forest; for though the latter covers a much larger area—and may possess a larger fauna when the whole Order is considered—Windsor has more species found nowhere else in Britain. The area is also evidently prolific in rare Diptera; and there can be little doubt that other Orders connected with old trees and forest habitats are richly represented. Coleoptera: *Velleius dilatus*, one of our largest rove beetles, confined to hornets' nests in trees, always rare; *Bolitochara reyi*, the only British capture; *Euryusa sinuata*, *Tacyusida gracilis*, *Euconnus pragensis*, *Batrisodes adnexus*, *B. delaportei*: all 5 likewise found nowhere else in Britain, are the most notable examples of a highly interesting and remarkable series of myrmecophiles or 'guests' of the ant *Lasius brunneus*, which nests in old decayed tree trunks, especially oak. *Atomaria rubricollis*, *Corticaria pietschi*, both unique as British; and many, many more, too numerous to mention.

In conclusion, and as a matter of interest, we may remark that a few years ago, while the Duke of Edinburgh was visiting the South London Entomological and Natural History Society booth during National Nature Week, that great conservationist, the late Dr A. M. Masee, spoke to his royal highness with considerable emphasis of the paramount need for the preservation of the ancient trees in Windsor Park.

Other Noteworthy Localities. Tilgate Forest, Sussex; Abbey Wood, Kent; Chattenden Wood and Roughs, Kent; Selsdon Wood, Surrey (good for Diptera); Vert Wood, Sussex; Farningham Wood, Kent (good for Hymenoptera); Warley Common, Essex; Scratch Wood, Middx.; Whippendell Wood, Herts.; Seal Chart, Kent; Ockham Common, Surrey; Challock Woods, Kent; Stanmore Common, Middx.; High Halstow, Kent; Black Park, Bucks.; Cobham Park, Kent (particularly good for Coleoptera); Hoads Wood, Kent (rare Lepidoptera); Wimbledon Common, Surrey; Cosford Mill, Surrey; Dering Wood and King's Wood, near Leeds, Kent (rare Hymenoptera); Sparrow Wood, Kent; Ashdown Forest, Sussex; Norbury Park, Surrey; Beckley Woods and Eridge Park, Sussex; Angley Wood, Kent; Covert Wood, Kent.

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Aggregation in *Agonum dorsale* Pp. (Col., Carabidae)

By J. MUGGLETON

The report of an aggregation of *Agonum dorsale* Pp. on Holy Island, off the Northumberland coast, by Benham (1969), raises again the need for a satisfactory explanation of winter aggregations in this species. Such aggregations have been reported on several occasions and these reports are summarised by Greenslade (1963a) in a list of aggregations in the British Carabidae. I have recorded aggregations of *A. dorsale* at Staines, Middlesex (Muggleton 1966, 1968). However, there does not appear to be any information available on the factors which stimulate the formation and dissolution of these aggregations and it will be worthwhile considering what these may be.

Greenslade (1965) gives the time of emergence of the adults as August and September and it seems probable that the beetles immediately seek shelter under various objects giving them protection against dessication and predators during the daytime. Herrström (1949) showed that when given the choice between sunlight, half shade and full shade, *A. dorsale* chose full shade. Therefore the beetles are negatively phototactic and this must be their primary motivation in seeking shelter under various objects.

The factors controlling the formation of the aggregations fall into two classes. Firstly there are those factors which determine when an aggregation first appears and secondly there must be those factors which induce the beetles to come together in aggregations. At this point it is important to note that the beetles do not enter diapause, but remain active throughout the period of aggregation and will scatter in all directions directly the object they are sheltering under, is lifted.

At Staines a record of the first appearance of the aggregation was made in 1965 and 1967. In 1965 it happened on 12th December and in 1967 on the 2nd September. The factors influencing the timing of aggregation may be either seasonal or biological. The small amount of evidence, given above, of variation in the timing of the first appearance of aggregation would appear to rule out seasonal changes (e.g. temperature and photoperiod) as the factors responsible for the timing. Biological controls, such as an internal timing factor, would also appear to be ruled out.